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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,713	07/25/2003	Randall Malterer	87324.1800	1897

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EXAMINER
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KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/626,713

Applicant(s)

MALTERER, RANDALL

Examiner

Kevin P. Kerns

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-16,18,19,21,22 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,8-16,18,19,21,22 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 and 11 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5, 6, 8-16, 18, 19, 21, 22, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (paragraphs [0002]-[0007] of specification) in view of either Wang et al. (US 5,429,173) or Lee (US 5,642,853), and further in view of Cheskis et al. (US 5,343,926).

The applicant's admitted prior art (AAPA) discloses a chill block, a method for its assembly, and the use of the chill block in a tool device as an assembly, in which the assembly includes a first surface of a chill block (base) made of steel coupled (bonded by grease and/or other connecting means) to a second surface of a chill block (base) made of copper, such that the chill block assembly includes first and second chilling means defining a chill block passageway therebetween, with the chill block assembly arranged within a tool device (mold defining molten metal inlet means and shaping means) that includes molten metal overflow means from the die/mold cavity (paragraphs [0002]-[0007] of specification). The AAPA does not specifically disclose forming the first surface or chill block in a ceramic mold, as well as specific types of steel, copper, and surface hardness of the materials. However, one of ordinary skill in

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the art would have recognized that use of a ceramic mold instead of a metal mold (both of which are refractory materials commonly used in casting processes), as well as use of any of the three types of steel and beryllium copper to obtain a surface hardness of 30 to 70 Rockwell "C" scale, would have been obvious substitutions of materials to a metal casting artisan, as these materials are functional equivalents (as well as conventional materials for use in casting processes), and a reasonable expectation of success would occur upon use of one or more of the combinations of these conventional, equivalent materials. The AAPA does not disclose a method of chemically bonding a second material to a first material surface, a rapid solidification spray casting process, a thickness of 0.5 inches for the first material/layer, and bonding of a third material to a side of a second material.

However, Wang et al. disclose a method of metallurgical bonding of metals and/or ceramics, in which the method includes embodiments of diffusion (chemical) bonding between two metals, including iron/steel to copper metallurgical bonding, such that the chemical bonding is advantageous for obtaining a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (abstract; column 1, lines 5-9 and 56-68; column 2, line 1 through column 8, line 43; and Figures 1-4).

In addition, Lee discloses a method of diffusion bonding steel to copper and copper alloys, in which the method includes chemical bonding between a copper layer 32 and a steel layer 34, such that the chemical diffusion bonding is advantageous for obtaining an interlayer material to yield a strong bond at elevated temperatures

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(abstract; column 1, lines 5-7 and 60-63; column 2, lines 1-20 and 37-67; column 3, lines 1-67; column 4, lines 1-28; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the chill block and the method for its assembly, as disclosed/suggested by the AAPA, by using the methods of diffusion (chemical) bonding between two metals that include iron/steel and copper, as taught individually by Wang et al. and Lee, in order to obtain a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (Wang et al.; abstract; column 1, lines 56-64; column 2, lines 4-33; column 4, lines 21-26; column 5, lines 55-68; and column 6, lines 1-6) and to obtain an interlayer material to yield a strong bond at elevated temperatures (Lee; abstract; column 1, lines 60-63; column 2, lines 1-20; and column 4, lines 21-25).

Neither the AAPA, Wang et al., nor Lee specifically discloses the rapid solidification spray casting process, the thickness of 0.5 inches for the first material/layer, and bonding of a third material to a side of the second material.

However, Cheskis et al. disclose a metal spray forming process and apparatus that uses multiple nozzles having at least two metal spray regions, in which the thickness of the spray materials is controlled by the speed of the moving substrate and flow rate of the atomizing gas, such that the spray materials are preferably copper or copper alloys, with the first and second spray deposits (16,17) forming coatings of second and third materials onto the moving substrate (first metal material) with varying degrees of thickness, resulting in a nearly uniform metal composite material 20 having

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desired physical properties (minimum of porosity) obtained via spray casting (abstract; column 2, lines 63-68; column 3, lines 1-2, 11-47, and 59-66; column 4, line 11 through column 9, line 41; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the chill block and the method for its assembly, as disclosed/suggested by the AAPA, by using the methods of diffusion (chemical) bonding between two metals that include iron/steel and copper, as taught individually by Wang et al. and Lee, in order to obtain a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (Wang et al.) and to obtain an interlayer material to yield a strong bond at elevated temperatures (Lee), and by further modifying the process of manufacture of the chill block by using a rapid solidification spray casting process, the thickness of 0.5 inches for the first material/layer, and bonding of a third material to a side of the second material, as taught/suggested by Cheskis et al., in order to obtain a nearly uniform metal composite material having desired physical properties, including a minimum of porosity (Cheskis et al.; column 1, lines 10-13; column 2, lines 63-68; column 3, lines 1-2, 11-14, 33-35, and 59-66; and column 4, lines 11-15, 41-46, and 59-63).

### ***Allowable Subject Matter***

3. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest a method of manufacturing a chill block that includes the steps of independent claim 1, and further includes the steps of machining the chill block after bonding a second material to a first material, and machining the chill block after bonding a third material to the second material (dependent claim 7).

#### ***Response to Arguments***

5. The examiner acknowledges the applicant's amendment received by the USPTO on November 30, 2005. The amendments overcome prior 35 USC 112, 2<sup>nd</sup> paragraph rejections. Dependent claim 7 has now been indicated as allowable subject matter in view of the amendments/remarks addressing independent claim 1. Claims 1, 3, 5-16, 18, 19, 21, 22, and 28-30 remain under consideration in the application.

6. Applicant's arguments filed November 30, 2005 have been fully considered but they are not persuasive.

With regard to the applicant's remarks/arguments on pages 7-11 of the amendment, the examiner respectfully disagrees with the applicant's major argument that the Cheskis et al. reference is not properly combined with the applicant's admitted prior art (AAPA) in view of either Wang et al. or Lee (as applied to independent claim 15, as well as amended independent claims 1 and 19 – all of which now include the

“rapid solidification spray casting process”. Although Cheskis et al. disclose the removal of a spray deposited alloy strip, the motivation provided by Cheskis et al. is to provide uniformity and other advantageous physical properties to the alloy strip, not in the embodiment that it is removable from the collecting member 18. Furthermore, on pages 10 and 11 of the remarks, the applicant states that the examiner “relied on no less than four references...”. However, the 35 USC 103(a) rejections (see paragraph 2) cite “either Wang et al. (US 5,429,173) or Lee (US 5,642,853)”, so only three references were necessarily combined to form the rejections under 35 USC 103(a) for all claims of record – except dependent claim 7, for which the examiner agrees with the applicant’s remarks on page 11 that address the “light machining”. Dependent claim 7 recites two steps of machining after respective steps of bonding the second and third materials.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns* 1/12/06  
Primary Examiner  
Art Unit 1725

KPK  
kpk  
January 12, 2006